

What is claimed is:

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546 c2 1. An adaptive writing method of writing input data on an optical recording medium using a write pulse whose waveform comprises a first pulse, a last pulse and a multi-pulse train, the adaptive writing method comprising:

(a) controlling the waveform of the write pulse in accordance with a magnitude of a present mark of the input data and magnitudes of a leading and/or trailing spaces of the present mark to generate an adaptive write pulse; and

(b) writing the input data on the optical recording medium using the adaptive write pulse.

2. The adaptive writing method according to claim 1, wherein the step (a) includes generating the adaptive write pulse by varying a rising edge of the first pulse in accordance with the magnitude of the leading space and the magnitude of the present mark.

3. The adaptive writing method according to claim 1, wherein the step (a) includes generating the adaptive write pulse by varying a falling edge of the last pulse in accordance with the magnitude of the present mark and the magnitude of the trailing space.

4. The adaptive writing method according to claim 1, wherein the step (a) includes generating the adaptive write pulse by varying a rising edge of the first pulse in accordance with the magnitude of the leading space and the magnitude of the present mark, and varying a falling edge of the last pulse in accordance with the magnitude of the present mark and the magnitude of the trailing space.

5. The adaptive writing method according to claim 1, wherein the step (a) includes generating the adaptive write pulse by shifting a rising edge of the first pulse in accordance with the magnitude of the leading space and the magnitude of the

4 present mark, and shifting the falling edge of the last pulse in accordance with the
5 magnitude of the present mark and the magnitude of the trailing space.

1 6. The adaptive writing method according to claim 5, further comprising
2 applying a light power for a predetermined channel during a period corresponding to
3 the shift of the rising edge of the first pulse and during a period corresponding to the
4 shift of the falling edge of the last pulse.

1 7. The adaptive writing method according to claim 6, wherein the light
2 power for the predetermined channel is read power or write power.

1 8. The adaptive writing method according to claim 1, further comprising
2 correcting the waveform of the adaptive write pulse in accordance with a land/groove
3 signal indicating whether the input data is data of a land track or data of a groove
4 track.

1 9. An adaptive writing method comprising:
2 (a) selecting one of grouping tables grouped by the magnitudes of marks and
3 spaces of input data, using grouping pointers;
4 (b) calculating a width of a write pulse using data stored in the selected
5 grouping table; and
6 (c) writing the input data using an adaptive write pulse generated in response
7 to the calculated width on an optical recording medium.

1 10. The adaptive writing method according to claim 9, wherein the grouping
2 tables store width data of first and/or last pulses of the write pulse waveform, by
3 grouping a magnitude of a present mark of the input data and magnitudes of leading
4 and/or trailing spaces of the present mark, into a short pulse group, a middle pulse
5 group or a long pulse group.

1 11. The adaptive writing method according to claim 9, wherein the grouping
2 tables store width data of the first and/or last pulses of the write pulse waveform, by
3 grouping a magnitude of a present mark of the input data and magnitudes of the
4 leading and/or trailing spaces of the present mark, into a short pulse group, a middle
5 pulse group or a long pulse group, depending on whether the input data is in a land
6 track or a groove track.

1 12. The adaptive writing method according to claim 9, wherein the grouping
2 tables store width data of the first and/or last pulses of the write pulse waveform, by
3 grouping a magnitude of a present mark of the input data and magnitudes of the
4 leading and/or trailing spaces of the present mark, into a short pulse group, a middle
5 pulse group or a long pulse group, for respective zones on the optical recording
6 medium.

1 13. The adaptive writing method according to claim 9, wherein the step (b)
2 comprises:

3 (b1) reading a shift value of a rising edge of a first pulse of the write pulse in
4 accordance with a combination of a magnitude of a leading space and a magnitude of
5 the present mark to calculate width data of the first pulse; and

6 (b2) reading a shift value of a falling edge of a last pulse of the write pulse in
7 accordance with a combination of the magnitude of the present mark and a
8 magnitude of a trailing space to calculate width data of the last pulse.

1 14. An adaptive writing method of writing input data on an optical recording
2 medium using a write pulse whose waveform comprises a first pulse, a last pulse and
3 a multi-pulse train, to optimize a light power of a light source, the adaptive writing
4 method comprising:

5 (a) discriminating between magnitudes of a present mark of the input data and
6 leading and/or trailing spaces of the present mark;

7 (b) generating pulse width data for varying widths of the first and/or last pulses
8 of the write pulse waveform in accordance with the magnitude of the present mark
9 and the magnitudes of the leading and/or trailing spaces; and

10 (c) generating an adaptive write pulse in accordance with the pulse width data,
11 and converting the adaptive write pulse into a current signal in accordance with
12 driving power levels for respective channels for the adaptive write pulse to drive the
13 light source.

1 15. The adaptive writing method according to claim 14, wherein the step (b)
2 comprises:

3 (b1) generating first pulse width data for shifting a rising edge of the first pulse
4 in accordance with the magnitude of the leading space and the magnitude of the
5 present mark; and

6 (b2) generating last pulse width data for shifting a falling edge of the last pulse
7 in accordance with the magnitude of the present mark and the magnitude of the
8 trailing space.

1 16. The adaptive writing method according to claim 15, further comprising
2 applying the light power for a predetermined one of the channels during a period
3 corresponding to the shift of the rising edge of the first pulse and during a period
4 corresponding to the shift of the falling edge of the last pulse.

1 17. The adaptive writing method according to claim 16, wherein the light
2 power for the predetermined channel is read power or write power.

1 18. The adaptive writing method according to claim 14, further comprising:
2 (d) correcting a waveform of the adaptive write pulse in accordance with a
3 land/groove signal indicating whether the input data is data of a land track or data of
4 a groove track, wherein the input data is NRZI (Non-Return Zero Inversion) data.

1 19. An adaptive writing method circuit for writing input data on an optical
2 recording medium using a write pulse for a light source and whose waveform
3 comprises a first pulse, a last pulse and a multi-pulse train, the adaptive writing circuit
4 comprising:

5 a discriminator to discriminate a magnitude of the present mark of the input
6 data and magnitudes of the leading and/or trailing spaces of the present mark;

7 a generator to control the waveform of the write pulse in accordance with the
8 magnitude of the present mark of the input data and the magnitudes of the leading
9 and/or trailing spaces to generate an adaptive write pulse; and

10 a driver to drive the light source by converting the adaptive write pulse into a
11 current signal in accordance with driving power levels for respective channels for the
12 adaptive write pulse.

1 20. The adaptive writing circuit according to claim 19, wherein the generator
2 includes:

3 a write waveform controller to generate pulse width data to vary a width of the
4 first pulse in accordance with the magnitude of the leading space and the magnitude
5 of the present mark and to vary a width of the last pulse in accordance with the
6 magnitude of the present mark and the magnitude of the trailing space; and

7 a write pulse generator to generate the adaptive write pulse in accordance with
8 the pulse width data.

1 21. The adaptive writing circuit according to claim 20, wherein the write
2 waveform controller comprises a memory in which the pulse width data of the first
3 and/or last pulses of the write pulse waveform are stored, by grouping the magnitude
4 of the present mark and the magnitudes of the leading and/or trailing spaces, into a
5 short pulse group, a middle pulse group or a long pulse group.

1 22. The adaptive writing circuit according to claim 21, further comprising a
2 microcomputer to initialize the write waveform controller and control the pulse width
3 data stored in the memory to be updated in accordance with write conditions.

1 23. The adaptive writing circuit according to claim 21, wherein the memory
2 stores the pulse width data of the first and/or last pulses of a write pulse waveform
3 depending on whether the input data is in a land track or a groove track.

1 24. The adaptive writing circuit according to claim 21, wherein the memory
2 stores the pulse width data of the first and/or last pulses of the write pulse waveform
3 for respective zones on the optical recording medium.

1 25. The adaptive writing circuit according to claim 20, wherein light power
2 for a predetermined one of channels of the adaptive write pulse is applied during a
3 period corresponding to a varied width of the first pulse and during a period
4 corresponding to a varied width of the last pulse.

1 26. The adaptive writing circuit according to claim 25, wherein the light
2 power for the predetermined channel is a read power or a write power.

1 27. The adaptive writing method according to claim 1, wherein the step (a)
2 comprises:
3 grouping each of a magnitude of the present mark and the magnitudes of the
4 leading and/or trailing spaces into groups;
5 comparing the group of the magnitude of the present mark with the groups of
6 the leading and/or trailing spaces; and
7 shifting a rising edge of the first pulse and/or a falling edge of the last pulse
8 based upon the comparisons of the group of the magnitude of the present mark with
9 the groups of the leading and/or trailing spaces, respectively.